

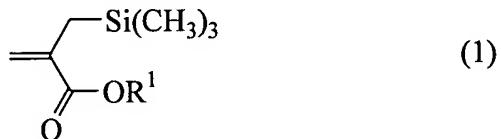


Application No. 10/671,732
Amendment dated October 7, 2005
Reply to Office Action of July 7, 2005

Docket No.: 0171-1022P

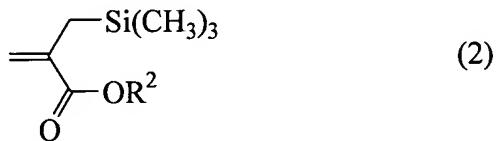
AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A polymerizable silicon-containing compound having the general formula (1):



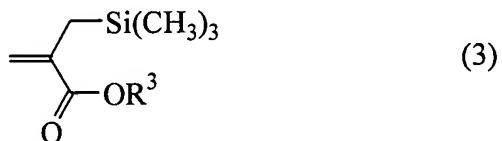
wherein R¹ is a hydrogen atom, halogen atom or monovalent organic group and R¹ is not a tert-butyl group, methyl group, ethyl group, trimethylsilyl group or triethylsilyl group.

2. (Currently Amended) A polymerizable silicon-containing ester derivative having an acid eliminatable substituent group and having the general formula (2):



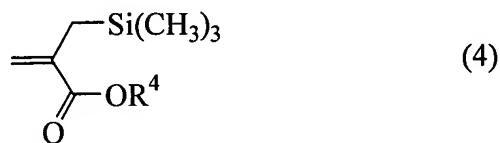
wherein R² is an acid labile group and is not a tert-butyl group, trimethylsilyl group or triethylsilyl group.

3. (Currently Amended) A polymerizable silicon-containing ester derivative having a ~~polar group according to claim 1~~ ~~[[,]] group~~, having the general formula (3):



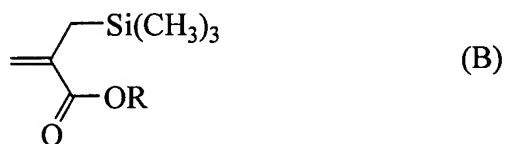
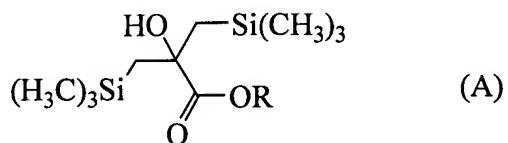
wherein R³ is a monovalent organic group of 2 to 30 carbon atoms containing an oxygen functional group.

4. (Currently Amended) A polymerizable silicon-containing ester derivative having a silicon-containing group according to claim 1[[,]] group, having the general formula (4):



wherein R⁴ is a monovalent organic group of 3 to 30 carbon atoms containing at least one silicon atom and R⁴ is not a trimethylsilyl trimethylsilyl group or triethylsilyl group.

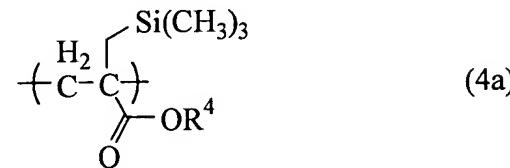
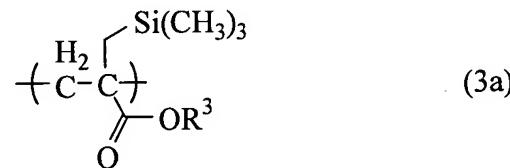
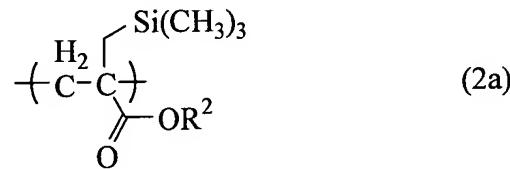
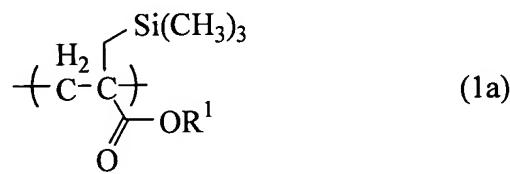
5. (Original) A method for preparing a polymerizable silicon-containing compound having the general formula (B), comprising the steps of reacting an oxalate with a trimethylsilylmethyl-metal compound to form a β-hydroxysilyl compound having the general formula (A) and subjecting the β-hydroxysilyl compound to Peterson elimination reaction,



wherein R stands for R¹, R², R³ or R⁴, R¹ is a hydrogen atom, halogen atom or monovalent organic group, R² is an acid labile group, R³ is a monovalent organic group of 2 to

30 carbon atoms containing an oxygen functional group, and R⁴ is a monovalent organic group of 3 to 30 carbon atoms containing at least one silicon atom.

6. (Original) A polymer comprising recurring units of the general formula (1a), (2a), (3a) or (4a) and having a weight average molecular weight of 2,000 to 100,000,



wherein R¹ is a hydrogen atom, halogen atom or monovalent organic group, R² is an acid labile group, R³ is a monovalent organic group of 2 to 30 carbon atoms containing an oxygen functional group, and R⁴ is a monovalent organic group of 3 to 30 carbon atoms containing at least one silicon atom.

7. (Original) The polymer of claim 6 further comprising recurring units of at least one type having the general formula (5a) or (6a):



wherein Y^1 , Y^2 , Y^3 and Y^4 are each independently selected from the group consisting of hydrogen, alkyl groups, aryl groups, halogen atoms, alkoxy carbonyl groups, alkoxy carbonylmethyl groups, cyano groups, fluorinated alkyl groups, and silicon atom-containing monovalent organic groups of 3 to 30 carbon atoms, any two of Y^1 , Y^2 , Y^3 and Y^4 may bond together to form a ring, Z is an oxygen atom or NR^5 , and R^5 is hydrogen, hydroxyl or alkyl.

8. (Original) A resist composition comprising the polymer of claim 6.

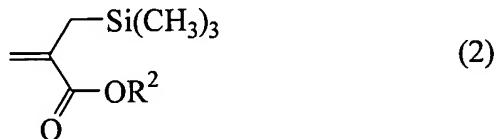
9. (Original) A chemically amplified positive resist composition comprising
(A) the polymer of claim 6,
(B) a photoacid generator, and
(C) an organic solvent.

10. (Original) A method for forming a pattern, comprising the steps of:

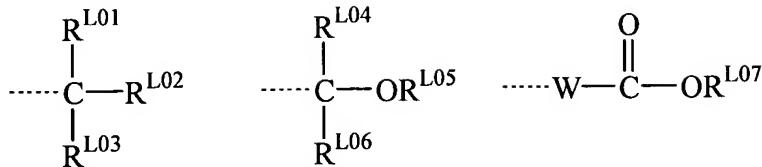
applying the positive resist composition of claim 9 onto an organic film on a substrate to form a coating,
prebaking the coating to form a resist film,
exposing a circuitry pattern region of the resist film to radiation,
post-exposure baking the resist film,
developing the resist film with an aqueous alkaline solution to dissolve away the exposed area, thereby forming a resist pattern, and
processing the organic film with an oxygen plasma generated by a dry etching apparatus.

11. (Cancelled)

12. (Currently Amended) A polymerizable silicon-containing ester derivative having an acid eliminatable substituent group and having the general formula (2): according to claim 2[[],]



wherein R² is an acid labile group selected from the [[class]] group consisting of groups of the following general formulae (L1) to (L3):



(L1)

(L2)

(L3)

wherein the broken line denotes a valence bond, $\text{R}^{\text{L}01}$, $\text{R}^{\text{L}02}$ and $\text{R}^{\text{L}03}$ are each independently a monovalent hydrocarbon group of chain or alicyclic structure having 1 to 20 carbon atoms, which may contain an ether bond, ester bond or sulfide bond and in which some of the hydrogen atoms may be substituted with halogen atoms, hydroxyl groups, alkoxy groups, carbonyl groups, acyloxy groups, cyano groups, a pair of $\text{R}^{\text{L}01}$ and $\text{R}^{\text{L}02}$, $\text{R}^{\text{L}01}$ and $\text{R}^{\text{L}03}$, or $\text{R}^{\text{L}02}$ and $\text{R}^{\text{L}03}$ may bond together to form a ring, when the ring is formed, each of $\text{R}^{\text{L}01}$, $\text{R}^{\text{L}02}$ and $\text{R}^{\text{L}03}$ is a divalent hydrocarbon group of chain or alicyclic structure having 1 to 20 carbon atoms which may contain an ether bond, ester bond or sulfide bond and in which some of the hydrogen atoms may be substituted with halogen atoms, hydroxyl groups, alkoxy groups, carbonyl groups, acyloxy groups, cyano groups, with priviso that $\text{R}^{\text{L}04}$, $\text{R}^{\text{L}05}$ and $\text{R}^{\text{L}06}$ are not methyl groups [[a]] at the same time, $\text{R}^{\text{L}04}$, $\text{R}^{\text{L}05}$ and $\text{R}^{\text{L}06}$ are each independently hydrogen or a monovalent hydrocarbon group of chain or alicyclic structure having 1 to 20 carbon atoms which may contain an ether bond, ester bond or sulfide bond and in which some of the hydrogen atoms may be substituted with halogen atoms, hydroxyl groups, alkoxy groups, carbonyl groups, acyloxy groups, cyano groups, a pair of $\text{R}^{\text{L}04}$ and $\text{R}^{\text{L}05}$, $\text{R}^{\text{L}04}$ and $\text{R}^{\text{L}06}$, or $\text{R}^{\text{L}05}$ and $\text{R}^{\text{L}06}$ may bond together to form a ring, when the ring is formed, each of $\text{R}^{\text{L}04}$, $\text{R}^{\text{L}05}$ and $\text{R}^{\text{L}06}$ is a divalent hydrocarbon group of chain or alicyclic structure having 1 to 20 carbon atoms which may contain an ether bond, ester bond or sulfide bond and in which some of the hydrogen atoms may be substituted

with halogen atoms, hydroxyl groups, alkoxy groups, carbonyl groups, acyloxy groups or cyano groups, R^{L07} is a group of formula (L1) or (L2), W is a divalent hydrocarbon group of chain or alicyclic structure having 1 to 20 carbon atoms which may contain an ether bond, ester bond or sulfide bond and in which some of the hydrogen atoms may be substituted with halogen atoms, hydroxyl groups, alkoxy groups, carbonyl groups, acyloxy groups or cyano groups.

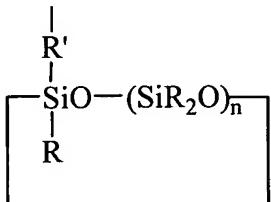
13. (Currently Amended) A polymerizable silicon-containing ester derivative of formula (3), according to claim 3, wherein the oxygen functional group is selected from the [[class]] group consisting of hydroxyl, carbonyl, ether bond [[or]] and ester bond.

14. (Cancelled)

15. (Currently Amended) A polymerizable silicon-containing ester derivative according to claim 13, wherein R^3 is selected from the [[class]] group consisting of straight, branched and cyclic hydrocarbon groups of 2 to 30 carbon atoms having a hydroxyl, alkoxy, carboxyl or alkoxy carbonyl group substituted thereon, and monovalent hydrocarbon groups of 3 to 15 carbon atoms having a lactone structure.

16. (Currently Amended) A polymerizable silicon-containing ester derivative according to ~~claim 14~~ claim 4, wherein R^4 is a silicon-containing organic group of the following formulas:

R_3Si- , $R_3Si-R'-$, $R_3SiO-R'-$,
 $R_3SiO-SiR_2-R'$, $(R_3SiO)_2SiR-R'$, $(R_3SiO)_3Si-R'$,



wherein R is an alkyl group of 1 to 20 carbon atoms or an aryl group of 6 to 20 carbon atoms, R' is an alkylene group of 1 to 10 carbon atoms, and the subscript n is at least 2.

17. (Previously Presented) A polymerizable silicon-containing ester derivative according to claim 16, wherein R is methyl, ethyl or phenyl, R' is an alkylene group of 1 to 5 carbon atoms and the subscript n is 2 to 7.

18. (New) A polymerizable silicon-containing ester derivative according to claim 4, wherein R^4 is a silicon-containing organic group of the following formula:



wherein R is an alkyl group of 3 to 20 carbon atoms.